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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/582,089	12/28/2006	Emmanuele Giacobbi	292272US0PCT	3990

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EXAMINER	
BOYLE, ROBERT C	

ART UNIT	PAPER NUMBER
1796	

NOTIFICATION DATE	DELIVERY MODE
07/14/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/582,089	GIACOBBI ET AL.	
	Examiner	Art Unit	
	ROBERT C. BOYLE	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 June 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Any rejections stated in the previous Office Action and not repeated below are withdrawn. The 112 second paragraph rejections of claim 16 presented in the previous Office Action are withdrawn because the relevant relative terms have been removed.

3. The new grounds of rejection set forth below are necessitated by applicant's amendments filed on May 20, 2009, June 2, 2009, and June 22, 2009. In particular, claim 1 has been amended to include the limitation: wherein the predefined area of the IR spectrum in the area starting at a wave number in the range from 1150 cm^{-1} to 1205 cm^{-1} and ending at a wave number in the range from 1020 cm^{-1} to 1085 cm^{-1}. The amendment to claim 1 changes the scope of the claim in a manner not previously examined. Claims 17-19 have been added. Thus, the following action is properly made FINAL.

4. Claims 1-19 are pending.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1 and 16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

7. The Amendment filed June 2, 2009 adds the term "directly" in process steps a), b), and c) in an effort to make clear that the sampling and analysis occurs without purification of the sample to be analyzed. Applicant points to the instant specification, page 13, lines 13-30 for support.

8. It is the Examiner's position that the cited material does not provide support for sampling and analysis without purification. Note page 13, lines 15-19 recite: "…a sample is taken from the production line, e.g. from the granules of the silane crosslinkable polyethylene or from the shaped article prior to curing or from another point of the production line and processed into a thin film..." The act of processing could include purification steps before analysis. Further, the negative limitation regarding a lack of purification was not found.

Claim Rejections - 35 USC § 103

9. Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fritz et al., *Sensor Development and Process Control in the Field of Polymer Compounding*, Nondestructive Characterization of Materials IV, edited by Ruud et al., Plenum Press, NY, 1991, in view of Bambara et al., U.S. Patent 5,883,144.

10. As to claims 1 and 6, Fritz teaches a process of graft polymerization of polyethylene with organosilanes (page 122, last paragraph) crosslinking the polymers (page 123, first paragraph), where a sample has been subjected to IR spectroscopy before crosslinking focusing on a portion of the IR spectra which includes a peaks at 1080 cm^{-1} and 1190 cm^{-1} (page 123, last paragraph). Fritz does not teach correlating with the gel content or making a film.

11. Bambara teaches one parameter for quantifying the degree of crosslinking is the gel content of the composition (column 16, lines 50-61) and the formation of films (column 18, line 64).). It would have been obvious to one of ordinary skill in the art that the degree of crosslinking is directly related to the amount of crosslinking agents grafted to the polymer, which is quantified by the IR spectra. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the measuring process in Fritz with the silane grafted polyethylene taught in Bambara because Bambara teaches improvement in the crosslinking behavior and using silane crosslinking to allow previously unsuitable polyolefins in foaming applications (see Bambara: column 4, lines 62-67; column 5, lines 19-43).

12. As to claim 2, Bambara teaches using polyethylene resins (column 9, lines 26-30).

13. As to claim 3, Bambara teaches using ethylene/butene copolymers (column 9, lines 26-30).

14. As to claims 4-5, Bambara teaches vinyltrimethoxysilane (column 13, line 20).

15. As to claims 7-8, Bambara teaches using peroxides to graft silanes to the polymers (column 11, lines 31-42; column 12, line 10).

16. As to claim 9, Bambara teaches the polymer is molded into a shape (column 18, lines 20-34).

17. As to claim 10, Bambara teaches granules (column 18, lines 20-32) and curing by hot water (column 13, lines 22-25).

18. As to claim 11, Bambara teaches using polyethylene resins (column 9, lines 26-30).

19. As to claim 12, Fritz teaches samples of varying concentration of silane (page 124, Fig. 3) and varying concentration of peroxide (page 124, Fig. 4), subjecting the samples to IR spectroscopy and examining specific peaks of the spectra (page 124, Fig. 3 and Fig. 4). Bambara teaches curing and measuring gel content which is correlated to the degree of crosslinking (column 16, lines 50-61). Fritz does not teach subtracting the spectra with a sample that has no silane and normalizing. However, it would have been obvious to one of ordinary skill in the art to do this because this is the use of a known technique to obtain predictable results. Subtracting two spectra and normalizing the result is a known technique to obtain a predictable result, the result being a spectra that shows the differences between the two original spectra.

20. As to claim 13, Fritz teaches five samples, one of which has no silane (page 124, Fig. 3, 4).

21. As to claim 14, Fritz teaches four samples of varying concentrations of peroxide (page 124, Fig. 3, 4). It would have been obvious to one of ordinary skill in the art to use

five samples because five samples were used for the other variable, the silane (page 124, Fig. 3 and Fig.4).

22. Further, it is the examiner's position that the number of samples used is a result effective variable because changing them will clearly affect the type of product obtained. See MPEP 2144.05(B). Case law holds that "discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art." See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In view of this, it would have been obvious to one of ordinary skill in the art to utilize the number of samples within the scope of the present claims so as to produce desired end results.

23. As to claim 15, Fritz teaches varying concentrations of silane and varying concentrations of the free radical source (page 124, Fig. 3 and Fig.4).

24. As to claims 16 and 19, Fritz teaches a method of testing the graft polymerization of polyethylene with organosilanes (page 122, last paragraph) crosslinking the polymers (page 123, first paragraph), where a sample has been subjected to IR spectroscopy before crosslinking focusing on a portion of the IR spectra which includes a peaks at 1080 cm^{-1} and 1190 cm^{-1} (page 123, last paragraph). Fritz does not teach correlating with the gel content or making a film.

25. Bambara teaches that controlling the quality of the product is desirable (column 1, lines 61-67). Bambara teaches one parameter for quantifying the degree of crosslinking is the gel content of the composition (column 16, lines 50-61) and the formation of films (column 18, line 64). It would have been obvious to one of ordinary

skill in the art that the degree of crosslinking is directly related to the amount of crosslinking agents grafted to the polymer, which is quantified by the IR spectra.

26. Bambara teaches one parameter for quantifying the degree of crosslinking is the gel content of the composition (column 16, lines 50-61) and the formation of films (column 18, line 64). Bambara teaches one parameter for quantifying the degree of crosslinking is the gel content of the composition (column 16, lines 50-61) and the formation of films (column 18, line 64). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the measuring process in Fritz with the silane grafted polyethylene taught in Bambara because Bambara teaches improvement in the crosslinking behavior and using silane crosslinking to allow previously unsuitable polyolefins in foaming applications (see Bambara: column 4, lines 62-67; column 5, lines 19-43).

27. As to claim 17, Fritz teaches the VTMOS is grafted without crosslinking present (Fig. 3, 4; pages 123-125).

28. As to claim 18, Fritz does not teach recycling the polyethylene. However, it would have been obvious to recycle unreacted material to increase reaction efficiency and reduce costs.

29. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fritz et al., *Sensor Development and Process Control in the Field of Polymer Compounding*, Nondestructive Characterization of Materials IV, edited by Ruud et al., Plenum Press, NY, 1991, in view of Bambara et al., (US 5,883,144) and Brant (US 2003/0130422). The

discussion with respect to Fritz and Bambara as set forth in paragraphs 9-28 above is incorporated here by reference.

30. As to claim 18, Fritz teaches graft polymerization of polyethylene with organosilanes (page 122, last paragraph) crosslinking the polymers (page 123, first paragraph), where a sample has been subjected to IR spectroscopy before crosslinking focusing on a portion of the IR spectra which includes a peaks at 1080 cm^{-1} and 1190 cm^{-1} (page 123, last paragraph). Bambara teaches one parameter for quantifying the degree of crosslinking is the gel content of the composition (column 16, lines 50-61) and the formation of films (column 18, line 64). Fritz and Bambara do not teach recycling the reactants.

31. Brant teaches separating and analyzing the product, and recycling the unreacted ingredients back to the reactor (abstract; paragraph 0040). It would have been obvious to one of ordinary skill in the art to use the recycling of Brant with the process of Fritz because Brant teaches polyethylene compositions for use in films, sheets and other molded products (Brant: paragraphs 0007, 0034, 0068) and it would have been obvious to recycle unreacted material to increase reaction efficiency and reduce costs.

32. Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shieh et al., *Silane Grafting Reactions of Low-Density Polyethylene*, Journal of Applied Polymer Science, Vol. 69, 255-261 (1998) in view of Bambara et al., U.S. Patent 5,883,144. The discussion with respect to Bambara as set forth in paragraphs 9-31 above is incorporated here by reference.

33. As to claims 1 and 6, Shieh teaches a process of graft polymerization of polyethylene with organosilanes, crosslinking the polymers, monitoring the grafting reaction by making films of the polymer and using FTIR at the 1092 cm^{-1} and 1192 cm^{-1} peaks without purification before analysis (abstract; pages 255-258; Figs 1-3). Shieh does not teach correlating with the gel content.

34. Bambara teaches one parameter for quantifying the degree of crosslinking is the gel content of the composition (column 16, lines 50-61) and the formation of films (column 18, line 64). It would have been obvious to one of ordinary skill in the art that the degree of crosslinking is directly related to the amount of crosslinking agents grafted to the polymer, which is quantified by the IR spectra. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the measuring process in Shieh with the silane grafted polyethylene taught in Bambara because Bambara teaches improvement in the crosslinking behavior and using silane crosslinking to allow previously unsuitable polyolefins in foaming applications (see Bambara: column 4, lines 62-67; column 5, lines 19-43).

35. As to claim 2, Bambara teaches using polyethylene resins (column 9, lines 26-30).

36. As to claim 3, Bambara teaches using ethylene/butene copolymers (column 9, lines 26-30).

37. As to claims 4-5, Bambara teaches vinyltrimethoxysilane (column 13, line 20).

38. As to claims 7-8, Bambara teaches using peroxides to graft silanes to the polymers (column 11, lines 31-42; column 12, line 10).

39. As to claim 9, Bambara teaches the polymer is molded into a shape (column 18, lines 20-34).

40. As to claim 10, Bambara teaches granules (column 18, lines 20-32) and curing by hot water (column 13, lines 22-25).

41. As to claim 11, Bambara teaches using polyethylene resins (column 9, lines 26-30).

42. As to claim 12, Shieh does not explicitly teach subtracting the spectra with a sample that has no silane and normalizing. However, it would have been obvious to one of ordinary skill in the art to do this because this is the use of a known technique to obtain predictable results. Subtracting two spectra and normalizing the result is a known technique to obtain a predictable result, the result being a spectra that shows the differences between the two original spectra.

43. As to claims 13 and 15, Shieh teaches five samples, one of which has no silane (page 257, Figure 1).

44. As to claim 14, Shieh does not teach samples of varying concentrations of peroxide. However, it would have been obvious to one of ordinary skill in the art to use varying concentrations of peroxide because varying concentrations of silane was performed and this is the use of a known technique to obtain predictable results. Subtracting two spectra and normalizing the result is a known technique to obtain a predictable result, the result being a spectra that shows the differences between the two original spectra.

45. As to claims 16 and 19, Shieh teaches a process of graft polymerization of polyethylene with organosilanes, crosslinking the polymers, monitoring the grafting reaction by making films of the polymer and using FTIR at the 1092 cm^{-1} and 1192 cm^{-1} peaks (abstract; pages 255-258; Figs 1-3). Shieh does not teach correlating with the gel content.

46. Bambara teaches that controlling the quality of the product is desirable (column 1, lines 61-67). Bambara teaches one parameter for quantifying the degree of crosslinking is the gel content of the composition (column 16, lines 50-61) and the formation of films (column 18, line 64). It would have been obvious to one of ordinary skill in the art that the degree of crosslinking is directly related to the amount of crosslinking agents grafted to the polymer, which is quantified by the IR spectra.

47. Bambara teaches one parameter for quantifying the degree of crosslinking is the gel content of the composition (column 16, lines 50-61) and the formation of films (column 18, line 64). Bambara teaches one parameter for quantifying the degree of crosslinking is the gel content of the composition (column 16, lines 50-61) and the formation of films (column 18, line 64). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the measuring process in Shieh with the silane grafted polyethylene taught in Bambara because Bambara teaches improvement in the crosslinking behavior and using silane crosslinking to allow previously unsuitable polyolefins in foaming applications (see Bambara: column 4, lines 62-67; column 5, lines 19-43).

48. As to claim 17, Shieh teaches the VTMOS is grafted without crosslinking present (abstract; pages 255-258; Figs 1-3).

49. As to claim 18, Shieh does not teach recycling the polyethylene. However, it would have been obvious to recycle unreacted material to increase reaction efficiency and reduce costs.

50. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shieh et al., *Silane Grafting Reactions of Low-Density Polyethylene*, Journal of Applied Polymer Science, Vol. 69, 255-261 (1998) in view of Bambara et al., (US 5,883,144) and Brant (US 2003/0130422). The discussion with respect to Shieh and Bambara as set forth in paragraphs 9-49 above is incorporated here by reference.

51. As to claim 18, Shieh teaches a process of graft polymerization of polyethylene with organosilanes, crosslinking the polymers, monitoring the grafting reaction by making films of the polymer and using FTIR at the 1092 cm^{-1} and 1192 cm^{-1} peaks (abstract; pages 255-258; Figs 1-3). Bambara teaches one parameter for quantifying the degree of crosslinking is the gel content of the composition (column 16, lines 50-61) and the formation of films (column 18, line 64). Shieh and Bambara do not teach recycling the reactants.

52. Brant teaches separating and analyzing the product, and recycling the unreacted ingredients back to the reactor (abstract; paragraph 0040). It would have been obvious to one of ordinary skill in the art to use the recycling of Brant with the process of Fritz because Brant teaches polyethylene compositions for use in films, sheets and other

molded products (Brant: paragraphs 0007, 0034, 0068) and it would have been obvious to recycle unreacted material to increase reaction efficiency and reduce costs.

Response to Arguments

53. Applicant argues that Fritz does not teach using the claimed range. This is not persuasive.

54. Fritz teaches observation of the γ(Si)-O-C oscillation peak at 1080 cm^{-1}, that the VTMOS proportions can be quantified without problems and tracking the polymers with variation of VTMOS content (page 123, last paragraph; page 124, Fig. 3, 4). See the above rejection.

55. Applicant argues that Fritz teaches away from using the claimed range for determining the crosslinking capability. This is not persuasive.

56. Fritz states: "Thereby it is advantageous to correlate the absorption levels of the VTMOS bands with the PE-peak at the wave number λ = 1375 cm^{-1} which is not influence by VTMOS addition." However, "the prior art's mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the solution claimed…." *In re Fulton*, 391 F.3d 1195, 1201, 73 USPQ2d 1141, 1146 (Fed. Cir. 2004). Fritz states a preferred wave number and does not criticize or discredit use of the claimed range.

Conclusion

57. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT C. BOYLE whose telephone number is (571)270-7347. The examiner can normally be reached on Monday-Friday, 9:00AM-5:00PM Eastern.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571)272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. C. B./
Examiner, Art Unit 1796

/Vasu Jagannathan/
Supervisory Patent Examiner, Art Unit 1796